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ABSTRACT

Two studies investigated treatments on the attribution and behavioral persistence of special education students (9 to 15 years old) labelled as helpless in arithmetic. In the first study (N=14), an attribution retraining treatment was effective in alleviating helplessness but not significantly more effective than a control treatment. In the second study (N=14), effects of three success-failure schedules (100% success, 76.9% success, and 46.2% success) on attributions and persistence were compared. Only the 76.9% success schedule increased attributions of failures to lack of effort and improved behavioral persistence in the face of failure. Results were interpreted as supporting B. Weiner's theory which suggests that an infrequently experienced event, i.e., failure, will be attributed to an unstable cause, i.e., lack of effort. (Author)

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Reinforcement Schedules, Effort vs. Ability

Attributions, and Persistence

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Abstract

Two treatment studies of special education students markedly helpless with regard to arithmetic are reported. The first experiment compared an attribution retraining (Dweck, 1975) treatment to a control treatment matched to it in schedule of successes and failures. Both the attribution retraining and control treatments proved effective in alleviating helplessness, but they were not differentially effective. The second experiment compared the effects of three success-failure schedules (100% success, 76.9% success, and 46.2% success) on attributions and persistence. Only the 76.9% success schedule increased attributions of failures to lack of effort and improved behavioral persistence in the face of failure. These results were interpreted as supporting Weiner's (1979) theory which implies that an infrequently experienced event, i.e. failure, will be attributed to an unstable cause, i.e. lack of effort.

Intermittent Schedules of Reinforcement: Effects
on Effort vs. Ability Attributions and Persistence

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Dweck (1975) devised a successful treatment for helpless children which involved both attribution retraining (emphasizing to the children that their failures occurred due to a lack of effort or trying) and an intermittent schedule of success and failure. Because intermittent reinforcement increases behavioral persistence (Eisenberger, Heerdt, Hamdi, Zimet, & Bruckmeir, 1979; Kennelly, Crawford, Waid, & Rahaim, 1980), the relative contributions of attribution retraining and the intermittent schedule to the attributional and persistence improvements of the helpless children after treatment is unclear in Dweck's study. This is so because the success only group, the only control group, differed from the attribution retraining group in schedule of reinforcement as well as in not having attribution retraining.

A similar criticism can be aimed at another successful treatment study by Andrews and Debus (1978). Both of their successful treatments involved intermittent schedules of success and failure as well as attribution retraining while their control procedure, a no treatment comparison, involved neither an intermittent schedule nor attribution retraining.

While a study by Chapin and Dyck (1976) appears to provide evidence of the independent positive effect of both intermittent reinforcement and attribution retraining on the persistence of helpless children, Chapin and Dyck note a possible confounding factor in their attribution retraining procedure.

The two experiments which comprise the present study were designed to determine, (1) if attribution retraining contributes anything of itself to the successful alleviation of helplessness in children; (2) the effects of several intermittent schedules of success and failure on the attribution and behavioral persistence of helpless children. Weiner's attribution theory (1974, 1979) implies that if failure is experienced as a relatively unstable, infrequently occurring event (as would occur in a schedule "rich" in successes and "lean" in failures), then failure should subsequently be attributed to an unstable cause, e.g. lack of effort, and the child should persist in the face of failure. In contrast, if failure is experienced as a relatively stable, frequently occurring event (as would take place in a schedule "lean" in successes and "rich" in failures), then failure should subsequently be attributed to a stable cause, e.g. lack of ability, and the child should continue to give up in the face of failure.

Experiment 1Method

Subjects and design. Fourteen male special education students, ages 11 to 15 years, nominated by their teachers for their helplessness in arithmetic, were formed into matched pairs based on their classification and their arithmetic problem skills. One member of each pair was randomly assigned to the attribution retraining (AR) condition and one to the control condition (Co.).

Procedure. The children participated individually. Prior to pretreatment and on the final posttreatment day a general academic attribution scale was administered. Each child worked 13 problem sets of five problems each during each daily session during the pretreatment, treatment, and posttreatment phases. On the last day of the pretreatment and posttreatment phases a measure of each child's performance deterioration in the face of failure was taken (Dweck, 1975). Both groups were treated identically during the pretreatment and posttreatment phases and experienced a continuous schedule of successes and token reinforcement on the problem sets which were selected to be well within each child's arithmetic competence. The only exception to this schedule occurred briefly to measure the child's performance deterioration after failure as

noted above. Pretreatment lasted 11 days, treatment, 15 days, and posttreatment 4 days. Each treatment session consisted of 10 problem set "successes" and 3 problem set "failures" randomly sequenced. On the "success" sets the children in both groups were treated identically. On the "failure" sets, in the AR condition, the experimenter verbally attributed the "failure" to a lack of trying (effort). In the Co. condition, the experimenter simply indicated failure without any attribution to effort or any other causal factor.

Results and discussion. As in Dweck's (1975) study, the major dependent measure of performance deterioration due to failure was a percentage failure deficit calculated by dividing the difference between prefailure performance minus postfailure performance, both defined by the number of correct problems solved per minute, by the prefailure performance and multiplying the result by 100. The means and standard deviations for this measure are presented in Table 1. The attribution scale means and standard devia-

Insert Table 1 about here

tions are presented in Table 2. Prior to treatment the

Insert Table 2 about here

attribution retraining and control groups did not differ significantly in either percentage failure deficits, $t(12) = 0.814$ ($p > .20$), or attributions for successes, $t(12) = 0.166$ ($p > .20$), or attributions for failures, $t(12) = 0.182$ ($p > .20$). Also, after treatment the two groups did not significantly differ on these measures, $t(12) = 0.784$ ($p > .20$), $t(12) = 0.911$ ($p > .20$), and $t(12) = -0.469$ ($p > .20$). Both groups, however, demonstrated significant pre- to posttreatment improvements in their percentage failure deficits, $t(6) = 2.992$ ($p < .025$) for the attribution-retraining group and $t(6) = 2.398$ ($p < .05$), both tests one-tailed. There were no significant attribution changes pre- to posttreatment for either group, $t_s \leq 0.916$ ($p_s > .20$), one-tailed tests. The results suggest that an intermittent schedule of reinforcement may increase the persistence of helpless children in the face of failure but that attribution retraining adds little or nothing of itself to their persistence. The failure to find a significant pre- to posttreatment change in attributions in either condition despite the significant changes in persistence might be interpreted to mean that the persistence

changes are independent of attributional changes. However, the fact that the attribution scale used was a general scale and Dweck (1975) and Andrews and Debus (1978) found attributional changes with specific scales but not with general scales casts doubt on this interpretation.

Experiment 2

This experiment considered the effects of three different success-failure schedules, one involving continuous success and two intermittent success, on the attributions and the persistence in the face of failure of previously helpless children. The schedules were 100% success, 76.2% success, or 46.2% success.

Method

Subjects and design. Twenty-one male special education students, ages 9 to 11 years, nominated by their teachers for their helplessness in arithmetic were formed into matched triads based on their arithmetic problem-solving skills. One member of each triad was randomly assigned to each of the three treatment groups, 100% success, 76.9%, and 46.2%.

Procedures. The procedures were modeled closely after those of experiment 1, except for the absence of any attribution retraining in any of the conditions, the use of an attribution scale specific to arithmetic, the schedules of success-failure used in the treatments, and a shortening

of the pretreatment phase to six days. The 46.2% group received tokens indicating successful completion of a problem set on an average of 6 out of 13 sets during each daily treatment session, the 76.9% group received these tokens on an average of 10 out of the 13 sets completed on each of the 15 treatment days. The 100% group received the tokens for 13 out of 13 problem sets daily. As in experiment 1, all groups were treated to what were basically continuous success schedules during the pretreatment and posttreatment phases.

Results. As in Dweck's (1975) study and experiment 1, the dependent measure of persistence in the face of failure was the percentage failure deficit. The means and standard deviations for this measure are presented in Table 3. The

Insert Table 3 about here

attribution scale means and standard deviations are presented in Table 4. In order to test the hypothesis that the three

Insert Table 4 about here

schedules of success-failure differentially affected persistence in the face of failure, a simple analysis of covariance,

with the pretreatment percentage failure deficits as covariate, was performed on the posttreatment percentage failure deficits. There was a significant overall $F(2,17) = 21.26$, $p < .01$. Planned comparisons indicated that the 76.9% group demonstrated significantly better persistence in the face of failure, as measured by the percentage failure deficits, than did the 46.2% group, $F(1,17) = 28.86$, $p < .01$, or the 100% group, $F(1,17) = 34.91$, $p < .01$. In fact, no member of the 76.9% group overlapped with any member of the other two groups posttreatment on this measure, and all but one member of the 76.9% group demonstrated a post failure improvement in performance during posttreatment. There was no significant posttreatment difference in percentage failure deficits between the 46.2% and 100% groups, $F(1,17) < 1$.

An ANCOVA of the posttreatment attribution scores, with the pretreatment attribution scores as covariate, was also performed. There was a significant overall $F(2,17) = 10.65$, $p < .01$. A series of planned comparisons indicated that the 76.9% group was less likely to attribute failures to a lack of ability (more likely to attribute them to lack of effort) than was the 46.2% group, $F(1,17) = 5.29$, $p < .05$, or the 100% group, $F(1,17) = 20.90$, $p < .01$. The 100% and 46.2% groups also significantly

differed, $F(1,17) = 6.47$, $p < .05$, with the former group demonstrating more attributions of failure to a lack of ability after treatment.

Discussion and conclusions. The second experiment's results suggest that a schedule of success-failure which is "rich" in successes and "lean" in failures is an effective treatment for helplessness. Schedules of success-failure which are continuous or are intermittent but "rich" in failures and "lean" in successes do not appear to be effective as treatments for helplessness. The fact that the schedule of reinforcement which was successful in improving persistence in the face of failure was also successful in changing the children's attributions of failures from lack of ability, a stable factor, to lack of effort, an unstable factor, supports Weiner's attribution theory. The two experiments taken together suggest that Dweck's (1975) attribution retraining treatment was effective not because of the attribution retraining but because of the schedule which was "rich" in successes but "lean" in failures. As Dweck suggested, however, the treatment's effect on behavioral persistence may be mediated by its effect on the attributions of the children. The results of experiment 2 point to the need for explicit theoretical formulation of the link between various intermittent reinforcement schedules and attributions, along with further empirical research.

References

- Andrews, G. R., & Debus, R. L. Persistence and the causal perception of failure: Modifying cognitive attributions. Journal of Educational Psychology, 1978, 70, No. 2, 154-166.
- Chapin, M., & Dyck, D. G. Persistence in children's reading behavior as a function of N length and attribution re-training. Journal of Abnormal Psychology, 1976, 85, No. 5, 511-515.
- Dweck, C. The role of expectations and attributions in the alleviation of learned helplessness. Journal of Personality and Social Psychology, 1975, 31, 674-685.
- Eisenberger, R., Heerdt, W. A., Hamdi, M., Zimet, S., & Bruckmeir, G. Transfer or persistence across behaviors. Journal of Experimental Psychology: Human Learning and Memory, 1979, 5, No. 5, 522-530.
- Kennelly, K. J., Crawford, D., Waid, L. R., & Rahaim, S. Partial reinforcement immunizes against helplessness induced short-term memory deficits. Catalog of Selected Documents in Psychology, 1980, 10, 59, Ms. No. 2091.
- Weiner, B. (Ed.) Achievement motivation and attribution theory. Morristown, NJ: General Learning Press, 1974.

Weiner, B. A theory of motivation for some classroom experiences. Journal of Educational Psychology, 1979, 71, No. 1, 3-25.

Table 1
 Percentage Deficits Due to Failure Pretreatment
 and Posttreatment: Means and Standard Deviations

	Attribution Retraining		Control	
	Mean	SD	Mean	<u>SD</u>
Pretreatment % Deficit	33.51	17.9	26.37	14.78
Posttreatment % Deficit	- 1.20	8.26	- 2.67	7.36

Note. Positive scores denote a deficit in performance immediately after failure. Negative scores denote an improvement in performance immediately after failure.

Table 2
Effort Attributions: Means and Standard Deviations
Pretreatment and Posttreatment

	Attribution Retraining		Control	
	Mean	<u>SD</u>	Mean	<u>SD</u>
Pretreatment				
Success	2.71	1.80	2.86	1.58
Failure	3.29	1.71	3.14	1.35
Posttreatment				
Success	3.86	1.26	3.43	1.31
Failure	3.71	1.72	4.00	1.17

Note. The attribution scale has ten items, five success and five failure items, of a forced choice (effort vs. ability) nature and scored in the effort attribution direction.

Table 3
 Pretreatment and Posttreatment Percentage
 Failure Deficits: Means and Standard Deviations

	Reinforcement Group					
	46.2%		76.9%		100%	
	Mean	<u>SD</u>	Mean	<u>SD</u>	Mean	<u>SD</u>
Pretreatment % Deficit	35.16	16.09	31.96	10.99	37.43	15.09
Posttreatment % Deficit ^a	33.89	17.82	-10.43	14.33	38.71	17.41

Note. Positive scores denote a deficit in performance immediately after failure. Negative scores denote an improvement in performance immediately after failure.

^aThe posttreatment means are adjusted means, adjusted for the covariate, the pretreatment percentage failure deficits.

Table 4

Ability Attributions of Failures in Arithmetic: Means
and Standard Deviations Pretreatment and Posttreatment

	46.2%		76.9%		100%	
	Mean	<u>SD</u>	Mean	<u>SD</u>	Mean	<u>SD</u>
Pretreatment	3.29	0.88	4.00	1.07	2.86	1.36
Posttreatment ^a	3.21	0.83	2.38	1.25	4.11	1.03

Note. The attribution scale is a five item forced choice (ability vs. effort) scale scored in the ability attribution direction. The item content is limited to arithmetic failure situations.

^aThe posttreatment means are adjusted means, adjusted for the covariate, the pretreatment attribution scores.